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HORTICULTURAL TESTS AND RESULTS

WITH

GARDEN VEGETABLES, FRUITS, AND BULB CULTURE.

Publications will be sent to any address in North Carolina upon application.

N. C. COLLEGE OF AGRICULTURE AND MECHANIC ARTS.

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HORTICULTURAL TESTS AND RESULTS

WITH

GARDEN VEGETABLES, FRUITS, AND BULB CULTURE.

By W. F. MASSEY, Horticulturist.

I. GARDEN VEGETABLES.

It has not been found practicable to conduct very extensive varietal tests, and only certain kinds are taken up annually. The attention of the horticultural division is mainly devoted to a study of methods for overcoming climatic difficulties with certain vegetables, new modes of culture and new crops for the South, together with systematic efforts to improve our small fruits by producing new varieties from seeds.

Cabbages.

Two varieties of early cabbage were tested the past season. One was an improved strain of the Early Wakefield, known as the *Charleston*. This variety is nearly, if not quite, as early as the old Wakefield, and makes a much larger head. The other was a variety known as *Burpee's Surehead*. Little if any difference could be seen in season between the two, and both headed certainly and regularly. The production of good heads of cabbage in late summer and early autumn is a difficult matter in this climate, but we have demonstrated this season that in a season of uniform moisture like the past, it can be done successfully, if the caterpillars are kept down. This can best be done by regular hand picking. We have also found that a mixture of air-slaked lime and salt, two parts of lime and one of salt, is very effectual in destroying the larvæ and seems to help the cabbages. Pyrethrum powder is good if fresh, but a pure and fresh article is expensive. For a late winter crop, seed sown late in July and transplanted a month later will give better results than earlier sowing, and fine heads can be had by Christmas or earlier.

The requisites for a good crop of fall and winter cabbage in this latitude seem to be: 1st. Heavy fertilization of the soil either with stable manure or a high grade ammoniated superphosphate. 2d. Incessant watchfulness to keep them free from insects. 3d. Constant and regular cultivation from the start. 4th. The use of a good strain of American grown seed. Most farmers appreciate good blood in an animal, but few understand that a good pedigree is of as much value

to a plant as an animal. Cabbage seeds grown in the moist climate of England can be put on our market at a lower price than American grown seeds can be produced—and there are jobbers in seeds that put these on the market as low priced seeds. They are the most costly seeds our growers can use, not because they will not grow, for they will, but because cabbage seed developed in the English climate will not head so uniformly as American grown seeds. Our growers had better pay $10 per pound for American seeds of good pedigree than have the imported seed given to them, though the imported seed will test fully as well in a laboratory test as the American grown Our leading seedsmen now offer under various names stocks of cabbage seed bred to great perfection in our climate. We have found the following perfectly reliable and of uniform quality.

EARLY CABBAGES.

Early Wakefield from various growers.—This is the standard early cabbage used by our market growers. All the stocks of this cabbage have been much improved of late years. Twenty years ago four or five types of head, and degrees of earliness, could be found in almost any lot of Wakefield cabbage. Now the stocks of our leading seedsmen have all been so carefully selected that the Wakefield is a uniform type of blunt conical heads, heading uniformly and together. Several separate types have been selected out of it. Among them one of the best is the

Charleston or Large Wakefield.—We had this also from more than one dealer, and for this latitude we are of the opinion that it should supersede the old type because of larger size, and little if any later.

Burpee's Express—This is an extra early cabbage of the Wakefield type, smaller in head, and earlier than the Charleston. Its outer leaves have a more upright habit, and more plants can be grown on an acre than of the Charleston, but with us it is much smaller.

Early Winningstadt.—But for its wide spreading outer leaves and the greater room needed, we could consider the Winningstadt one of the best early cabbages for this latitude. At the North it is always rated a second early, but we have repeatedly shown that southward it is little behind the Wakefield, and is one of the hardest and most certain headers. But it must be planted much further apart than other early cabbages—which is an objection. Winningstadt is less liable to run to seed from getting too large an autumn growth than others.

SECOND EARLY CABBAGES.

Henderson's Succession and *Fottler's Improved Brunswick* are so much alike that we confess we cannot well separate them. They are both very uniform headers, of large flat heads, with exceedingly stout stems, and are as good as we know of as a succession crop up to July, and as a late crop to grow from seeds sown late in July or early in August.

LATE CABBAGES.

We have made no varietal tests of late cabbages, except Premium Flat Dutch and the above varieties. The strains of Premium Late Flat Dutch Cabbage now offered by our leading seedsmen, are all remarkably pure. But heretofore the climatic difficulties have deterred us from attempting a comparison of varieties offered under other names. This we hope to do the coming season.

MELONS.

We made last year quite an extensive varietal test of muskmelons, with a view to determine the sorts best adapted to our climate. The test was continued the past summer with the hope of verifying the conclusions formed. But, owing to wet weather at ripening time, no results of value were obtained, except as to the resistant qualities of some.

Burpee's Netted Gem.—This is probably the earliest and most prolific of the nutmeg cantaloupes. Flesh green, thick and sweet. A very valuable sort for early market.

New Early Hackensack.—Flattened, deeply ribbed and well netted. Flesh green. Earlier than the old Hackensack. Fair size and a good shipper.

Montreal Market.—This a green-fleshed, deeply ribbed, late melon, which grows to an immense size. It makes a fine melon to look at, but it is late, and of such inferior quality that no one accustomed to good melons would care to eat it. Will do to grow for the fall fairs for people to stare at. Specimens have been grown weighing nearly 40 pounds, and 18 to 20-pound melons are about the average.

Emerald Gem.—In all of our tests for years this variety has uniformly stood first as to quality of fruit. Skin slightly ribbed, dark grass green, with silvery stripes in the depressions. Flesh very thick, and of a deep orange color. We are satisfied that as to flavor it is unexcelled. It is not so early as some others, but is prolific, and should make a good market melon in a market where its quality becomes known. It stands wet weather better than most others.

Acme, Baltimore Market, or *Anne Arundel.*—A melon largely grown in Anne Arundel County, Maryland, for the Baltimore market. It is one of the earliest and most prolific of the green-fleshed nutmeg melons. Slightly oblong in shape and pointed towards the blossom end. Skin finely netted. One of the best market sorts, and of uniformly fine flavor. Rather the best of the green-fleshed sorts.

Osage, Miller's Cream, Miller's Hybrid.—Osage is probably the proper name for this variety. Rind green, shading to a yellow flesh. Early, of good size and fair quality, and is being grown considerably for market. Not so productive as the Baltimore Market.

Bananas.—A curious looking melon, like an immense cucumber. Skin smooth and yellow; flesh orange color. We have grown this melon four feet long. Very large specimens are usually of good

flavor, but most of the smaller ones are very poor flavored. Only worth growing as a curiosity.

Surprise.—This, with us, did not agree with any of the catalogue descriptions. In general appearance it looked like the Banana melon pushed endwise into a roughly round shape. Skin yellow; flesh salmon color. Quality poorer than Banana. Worthless.

Banquet.—A perfectly globular melon, with a densely netted skin. It was sent out as of better quality and larger size than the Emerald Gem. With us it was decidedly smaller, and much inferior in quality. The flesh is deep orange salmon, and very thick. Too small for market and too poor for home use.

Delmonico.—An oval shaped melon, ribbed and netted on the outside. Flesh deep orange color, and quite thick. Quality good, but not equal to Emerald Gem. Will make a good market sort.

Garden Corn.

For some years past we have been endeavoring to fix a good variety of sugar corn adapted to a southern latitude. For this purpose, we have been using a cross between the Leaming, an early yellow field corn, and the Mammoth Sugar Corn. This cross was made by Mr. McCluer, of the Illinois Station, in 1888. Some of this of the second season's growth from the cross was placed in our hands in the fall of 1890, and first planted here in spring of 1891. This cross was selected because the Mammoth Sugar has always succeeded better in the South than the early sorts, and the Leaming gave earliness and stamina. The Leaming being a yellow corn would enable us to select seed combining the characters of both. We have grown this corn now for three seasons, always selecting for planting the yellow wrinkled grains. It is not yet fully fixed in its character, as a considerable amount of mixture still appears in the grains, but by persevering selection we hope soon to have a variety well suited to Southern gardens. It grows of fair medium height, and is quite early. Selected seeds will this season be placed in the hands of a few careful cultivators at other points in the State, with the hope that the selection will be continued. Will continue to select and plant it here.

Cucumbers.

The cucumber crop having attained considerable importance in our State as a market crop, we propose this season to make a comparative test of varieties. Cucumbers are largely grown under glass in winter around the Northern cities, and are sold at high prices. As all winter forcing must be done there at great expense in houses and with extra fuel, it is an interesting question to determine whether in our milder climate the same culture cannot be done fully as well and at a larger profit. A large grower of forced cucumbers near Boston has been seriously considering the advisability of moving his plant to North Carolina. As these forced cucumbers sell at prices ranging

from $1.25 each to 10 cents for last crop in spring, it can readily be seen that there is room for the appliance of extra expense and skill in their production. Experiments in this culture will be made at the Station the present winter. Our gardeners do not take as much advantage in the use of glass as they might, and we desire to show the desirability of acquiring skill in this department of culture. Every market gardener who wishes the best success should have at least one small greenhouse, heated by flue or by hot water, for the purpose of forwarding plants of many kinds, and an abundant supply of sashes on frames for protecting and forwarding plants for setting in open ground, or for growing some things at an earlier period, and thus get in advance of his natural climate. The use of oiled cotton cloth is a poor substitute for glass, and it is in the long run more expensive. Cotton cloth is useful only for protection in spring, but is of little value for winter work. It is our purpose soon to prepare a special Bulletin on the use of glass.

Egg Plants.

Experiments, which we have made, show that a gardener with a good supply of sashes, and a greenhouse for starting the plants in pots, can put this crop in market by the first of July, at which date they will always pay very well. They are hot-weather plants and cannot go out early. When sashes have been used for forwarding tomato plants, and after the tomato plants are moved to the open ground, egg plants that have been grown in pots in the greenhouse, can be set two plants to a sash, and the glass still kept over them until weather is warm and settled, and thus brought early into bearing. We once grew 600 sashes in this way in Northern Maryland and put the product in market ahead of those from Charleston. A similar practice here would be more effective.

Lettuce.

We have made no extensive varietal tests of lettuce since 1891, but have found no variety that excels the Boston Market for growing in frames for shipment. It is easy here with only the use of sashes on cold nights to have lettuce headed well for shipment by Christmas and during January, at which time it will always command a remunerative price, particularly in the Washington and Baltimore markets. It is a curious fact that the supply of winter lettuce to these cities comes largely from Boston, where it is largely grown in fire-heated greenhouses. As equally good lettuce can be grown here with the simple cover of a sash or a cold frame, it would be to the interest of our growers to look into this matter.

Onions.

For two seasons past we have made special varietal tests of onions, and also modes of culture. Our land at the Experiment Farm is

poorly adapted to the culture of this crop, being a compact red clay, and yet our success with them shows plainly what can be done in this line here. We have demonstrated that for the production of ripe onions the old practice of using sets is not necessary, since fully as large crops of better onions can be made here by sowing the seed. Owing to the fact that our autumn weather is apt to be dry, and seed difficult to germinate, it is probable that for the production of early grown onions for bunching in February and March, it will always be better to use sets. But when seed can be got to germinate well in September the process is cheaper and just as good in product. For the main crop we have used two methods of sowing seed. One is to sow them thickly in cold frames protected by sashes in January and transplant them to the open ground late in February. The other is to sow the seed directly where they are to grow, as early in February as the soil can be well gotten in order. The transplanted onions will with some varieties make much larger bulbs, while with some others the difference is not enough to make the extra expense profitable. The Italian varieties are generally large and early, but they and the Spanish or Bermuda are bad keepers, and when the crop is grown for the local market the next winter they should not be used. They are useful for shipping North as early ripe onions. We give the results of our tests as follows. It is to be noted that a globular onion usually gives a better crop than a flat one, and is almost invariably a better keeper.

AMERICAN ONIONS.

Southport White Globe.—A New England variety. Round as a base ball, very solid and a good keeper, makes a fine crop from seed sown in February and not improved by transplanting. We consider this the best white onion for main crop.

Large Red Globe.—A fine cropper of large globular shape, and brings the highest price of any red onion. Worth further test.

Wethersfield Large Red.—A large, rather flat onion, but a good cropper and good keeper. Very strong.

New Opal.—The seed of this was received from Messrs Tait & Sons, Norfolk, Va, with special recommendation as to its keeping quality. We have found it all that is claimed for it. Shape roundish, flattened; color light red. This is the most solid and heavy for its size of any we grow, and is a remarkable keeper.

Extra Early Red.—A flat onion. Fair cropper and quite early.

Round Yellow Danvers—An early round yellow onion, but not equal to the

Yellow Globe Danvers.—This is one of the finest globular yellow onions we have tested. Does well transplanted, which few of the American sorts do.

ITALIAN AND SPANISH ONIONS.

New Mammoth Pompeii.—A large, flat, pinkish onion, which, when

transplanted, grows to a very large size. Also gives a fine crop from seed sown in February, With one exception, the Giant Rocca, we have found these Italian onions all poor keepers.

Giant Rocca.—A very large onion of a reddish brown color. It should always be sown early and transplanted, as it is a late variety, and requires a long season to attain full size. When thus treated it reaches enormous proportions.

Queen.—A flat white onion; among the earliest of all. Very similar, but rather smaller than the

Pearl.—A flat white sort, now getting popular as a variety to grow from fall planted sets for early bunching. For this purpose it is unsurpassed.

Large White Italian Tripoli and *Large Red Italian Tripoli* are both quick-growing, flat onions, of similar character but different color. They will do well for early shipment as ripe onions.

Giant White Garganus.—This is the earliest very large onion we have tried. Rather flat in shape. A good cropper, and ought to make a profitable onion for early shipment ripe.

Barletta.—A small white onion of quick growth. It makes pretty little onions of uniform size, and would be desirable for pickles. It can be sown in August, after some early crop, and make a good crop of pickles.

Bermuda Onions, Red and White.—These are really Spanish onions. They grow quickly, are very flat in shape, but are very poor keepers. They might be made a profitable onion for early shipment as ripe onions, but we think the Garganus better.

Prize Taker.—This is a Spanish variety, and is the big yellow onion so often seen at our grocery stores, It makes a much heavier crop by being sown early under glass and transplanted, and should always be treated in this way. It is not a good keeper but better in this respect than most others of the class.

POTATO ONIONS.

These make no seeds, but increase by the offsets. They are therefore always grown from sets. Being bad keepers, the sets should always be planted in the fall. There are two sorts, the yellow and the white. We have found the yellow the largest, and it is a profitable sort to grow for shipping North as an early ripe onion; but the crop must be disposed of as soon as ripe. The white potato onion promises to be valuable as an early grown bunching onion.

RESULT OF TEST DURING 1893.

The tabulated statement below gives the result of the test of several varieties. Onion seed were scarce in spring of 1893, and we used, without preserving name of seedsman, much old seed. The result shows that most of the seed sold was probably two years old. The stand was poor, and crop a failure. Our notes are largely from results of 1892, when crop of all was good.

TEST OF ONIONS DURING 1893.

	VARIETY.	SOURCE.	DATE SOWN IN OPEN GROUND.	GERMINATED.	HARVESTED.	RESULT.
1	Red Globe	Burpee	March 5	March 30	August 4	Medium size; early; good keeper.
2	Pale Red Bermuda	Two-year seed	" 5	" 29	" 4	Flat; poor keeper.
3	White Portugal	Two-year seed	" 5	" 23	" 4	White; mild; keeps well.
4	Giant Rocca	Tait	" 5	" 24	" 4	Large brown; poor keeper.
5	White Victoria	Burpee	" 5	" 25	" 4	Globe shape; good keeper.
6	Queen	Old seed	" 5	" 28	" 4	Early; white; good for bunching.
7	Yellow Danvers	Old seed	" 5	" 29	" 4	Round; yellow; good keeper.
8	Barletta	Old seed	" 5	" 29	" 4	Flat; white; early; inferior to Queen.
9	White Garganus	Tait	" 5	" 28	" 4	Large and good, but keeps badly.
10	Wethersfield Red	Old seed	" 5	" 30	" 4	Good cropper and fine keeper.
11	Extra Early Red	Burpee	" 5	" 24	" 4	Early; medium size; keeps well.
12	Prize Taker	Burpee	" 5	" 27	" 4	The most showy onion; heavy cropper.
13	Red Victoria	Old seed	" 5	" 28	" 4	Medium size; bad keeper.
14	New Opal	Tait	" 5	" 20	" 4	Flat; hard and fine keeper.
15	Round Yellow Danvers	Burpee	" 5	" 23	" 4	Next to Prize Taker.
16	Large Red Wethersfield	Tait	" 5	" 23	" 4	Old well known red; good keeper.
17	Mammoth Pompeii	Old seed	" 5	" 20	" 4	Large and fine but worst keeper.
18	White Globe	Burpee	" 5	" 20	" 4	Seems identical with No. 20.
19	White Bermuda	Old seed	" 5	" 23	" 4	White; flat; will not keep.
20	Southport White Globe	Tait	" 5	" 22	" 4	Globe shape; good keeper; finest white.
21	No name	Burpee	" 5	" 21	" 4	Sent for test without name; small, soft and very poor keeper.

Irish Potatoes.

No extensive varietal tests have been made recently, as our attention has been directed mainly to a series of experiments to determine the value of our late fall crop for seed. We began a series of experiments in connection with the New York Cornell Station and the Maine Station, they sending us potatoes raised there to plant in comparison with fall crop raised here the previous year from same stock; while we were to send them fall-grown Southern potatoes for planting there. The results here were strikingly in favor of the Southern-grown seed. For some reason the Northern stations dropped the work and sent us no seed this season, and we have had no report from those sent from here for planting there. It seems evident that a large demand is soon to spring up for the late crop potatoes for planting North, as many Northern gardeners have found these to be superior for planting there to their own seed.

The crop of early potatoes was small with us this year, but the favorable autumn made the late crop unusually fine.

It is proposed to experiment further by keeping over some of this season's late crop to plant next summer in comparison with the crop of same season.

Tomatoes.

The past season has been particularly unfavorable for tomatoes here, both early and late. The bacterial disease known as Southern Blight was particularly destructive, both on the Station and College farms. We have made but few varietal tests, being engaged mainly in studying how to prevent blight, or to produce varieties resistant to the disease. Among the new varieties tested, a sport from Essex, the *Lemon Blush*, a new variety raised by Mr. E. S. Carman, was the most perfect tomato we ever raised, and seemed resistant to disease. *Terra Cotta*, a seedling of Mr. Carman's, raised from a cross of Ignotum on Peach, was found to possess valuable qualities. It is of a dull terra cotta color, with lusterless skin like the Peach tomato, and while apparently soft, has wonderful keeping qualities; entirely destitute of hard core; for home use valuable in its present shape, and likely to prove of use in crossing; resistant to disease. The most productive tomatoes here, and most resistant to climatic influences, are the plum and pear-shaped varieties. We propose to take up the work of crossing them with Terra Cotta and others, hoping to develop a variety more valuable in this climate than any we now have. The tomato crop of 1893 was very inferior as a rule, and the results with the varieties tested can hardly be considered conclusive.

TEST OF TOMATOES DURING 1893.

VARIETY.	SOURCE.	SOWN.	GERMMINATED.	PLANTED.	RIPE.	RESULT.
Matchless	Burpee	Feb'y 10	Feb'y 24	April 3	June 29	Large, solid and good; second early.
Trucker's Favorite	Burpee	" 10	" 27	" 3	" 27	Good; smooth and solid.
Nichols' No. 5	Nichols	" 10	" 20	" 3	" 23	Good; medium size; early.
Lemon Blush	Thorburn & Carman,	" 10	" 20	" 3	" 22	Solid; very smooth, but yellow.
Lorillard	Thorburn	" 10	" 21	" 3	" 29	Round; smooth red; healthy.
Golden Ball	Livingston	" 10	" 22	" 3	" 28	Medium size; smooth; yellow.
Large Rose Peach	Livingston	" 10	" 20	" 3	" 24	Rather larger than Peach; no better.
Buckeye State	Livingston	" 10	" 22	" 3	" 25	Rotted badly; failure.
Aristocrat	Livingston	" 10	" 22	" 3	" 25	Rotted badly; failure.
Favorite	Station	" 10	" 23	" 3	" 23	Large; smooth; best.
Early Ruby	Station	" 10	" 21	" 3	" 19	Earliest of all; not smooth.
Ignotum	Station	" 10	" 21	" 3	" 23	Rotted and failed, as it always does.
Mikado	Station	" 10	" 21	" 3	" 23	Large; rough; early.
Livingston's Beauty	Station	" 10	" 22	" 3	" 23	One of the finest.
White Globe	Thorburn	" 10	" 21	" 3	" 29	Promising; crop failed.
Terra Cotta	Thorburn & Carman,	" 10	" 22	" 3	" 22	Early; productive; good for home use and crossing.

II. FRUITS.

Strawberries.

We have been testing for two years a large number of seedling strawberries of our own production. By far the larger number will be discarded. Eight varieties were selected and named for further test. As these names are only tentative, we will still hold them by numbers and not allow them to go out under name until we feel sure that they are worthy of the names.

No. 1. Has for two seasons proved to be an excellent berry; large, very productive, well flavored and firm; second early.

No. 2. Firm; good size and shape; promising.

No. 3. Very prolific; smooth large and excellent.

No. 4. Very late; extends the season, but is rather soft.

No. 5. One of our best, of fine shape and good cropper.

No. 6. A very fine large late berry, but we fear too soft.

No. 7. A good late berry, but inclined to be soft.

No. 8. Very large and fine, but we fear too soft.

We have tested other varieties with the following result:

West Lawn.—A new variety from Bauer Bros., of Judsonia, Ark. This was the earliest berry ripe with us the past season. A large conical, firm berry resembling Sharpless. The most promising early berry we have tested.

Belle.—From Cleveland Nursery Co., Rio Vista, Va. Long solid berry, prolific, early as Michal's and far superior to it. Makes many immense coxcomb fruits.

Thompson's No. 9.—From same source. Rather smaller but of more uniform shape than Belle, and later. A good bearer and good flavor. Promising.

Parker Earle.—This much praised sort cannot be recommended for market purposes. It sets an immense crop, but ripens it slowly and runs down small. Might be useful in a family garden, but perfectly worthless for the market grower.

Smettzer's No. 2.—A large but irregular berry, too soft for market and not very productive.

Raspberries—Blackcaps.

Jackson's May King.—Ripe June 1st. Blackcap. Small, dry, not worth growing.

Ada.—Ripe May 25th. A small blackcap, not productive nor good.

Lovett's Best.—One of the finest of its class; very productive of fine fruit. Ripe May 26th.

Thompson's Early.—A complete failure.

Cromwell.—Ripe May 23d. Earliest and a good bearer. Promising.

Smith's Prolific.—Ripe May 27th. Very productive and stands climate well.

Palmer.—Ripe May 25th. Very prolific, large and good. Promising.

Blackberries.

Child's Tree Blackberry.—The name is deceptive, for it is not tree-like in any way, but has the ordinary habit of high bush blackberries. The fruit is good size and of good quality. Ripens too scattering for a market berry. Ripe June 19th.

Early King.—The earliest; a heavy cropper of fine sized fruit. Promising.

Thompson's Early.—Very early. Large fruits, fine cropper and solid when black for shipment.

Lovett's Best.—A late berry of medium size, rank growth and moderate crop.

Child's Wineberry—A Japanese species of the Raspberry family. The canes grow rankly, and the stems are covered with reddish hairs, as is also the calyx of the fruit. Fruit bright red, and of a sprightly acid flavor. Quite unproductive, and of no use except as a curiosity.

Grapes.

A large portion of the varieties of grapes that have been in cultivation here, over 120 varieties, have been discarded as of no special value. Our chief work the past season with grapes has been in experiments to check the black rot and other fungus diseases.

We have planted a number of cross-bred seedlings raised by Mr. Munson, of Dennison Texas, which have not yet fruited, but from which we anticipate some good results, as they are a departure from the kinds usually sent out at the North, being crossed with native Southern species and therefore more likely to suit our climate. The only new Northern grape fruited this year was the

Green Mountain sent by Messrs. Stephen Hoyt Sons, of Connecticut. This is a good healthy grower. Greenish white fruit and is the earliest *good* grape we have tried. It ripens as early as the worthless Champion. Skin quite tender and pulp sweet and pleasant. We fear it will not ship well. This is identical with the *Winchell* grape sent out by Elwanger and Barry, of Rochester, N. Y., and one of the names should be dropped.

Prevention of Grape Rot.

Having a long trellis, mainly covered with Concord vines, on the west boundary of the Station grounds, we closed the west side of part of the trellis with boards, and placed a coping of boards projecting 18 inches on the top on the east side. This part of the trellis had no other treatment. The remaining part was sprayed three times with Bordeaux mixture Both parts were nearly free from rot, while

vines exposed and not sprayed lost their entire crop from rot. The sheltered trellis protected the vines from rot fully as well as the spraying. But later in the season the Thrip insect developed in great numbers under the shelter, and destroyed the foliage to such an extent that the grapes did not ripen well. The experiment will be continued next season with the coping alone. We are inclined to think that a cheap coping can be made that will ward off rot as effectually as spraying, and be fully as cheap.

GRAPES UNDER GLASS.

Our grapery for the culture of the exotic grapes was completed and planted June 10, 1891. The vines made such a remarkable growth during that summer that several of them were allowed to ripen a bunch or two of fruit in 1892. The past summer the house produced a full crop of remarkably fine fruit, bunches of nearly four pounds weight being cut; and the house, 16 x 30 feet, produced about 350 pounds of grapes. The house was built for two purposes: First, for cross breeding with our native grapes to raise improved varieties; second, to test the practicability of growing these grapes profitably under glass for shipment. No fire heat is used in the house, and the vines, after pruning in the fall, are laid down along the inner side of the wall, exposed to the cold through openings in the wall, and covered with boards and earth to keep them from being affected by the warmth of the glass in winter. The past season they were kept back in this way as late as possible in spring, so as to have fruit for exhibit at the State Fair. We made one small shipment of fruit to Boston, which, unfortunately, reached there at the time of the first arrival of California grapes, and sold for only 20 cents per pound. Two weeks earlier they would have sold for 75 cents, at which price there is a good profit in growing them. The coming season the vines will be allowed to start earlier, so as to have the fruit ready to ship last of July or early August, at which date they will doubtless bring good prices, as the California product is not in.

For hybridizing purposes, we have planted in the house one of Mr. Munson's seedling grapes, "*Brilliant*," and soon hope to produce some hybridized seedlings.

Figs.

Though we have over thirty varieties of figs under cultivation, we have, as yet, had no opportunity to give full comparison of quality of fruit, since our plants have been kept cut too hard for propagation to supply the demand for the trees. As we have now closed the distribution of plants, we hope to have an opportunity to ascertain something definite in regard to the hardiness of the plants, quality of the fruit, etc. The severe winter of 1892-'93 cut down all unprotected figs to such an extent that the crop was a failure this season.

The following sorts seem to be the hardiest in winter: Brown Turkey, or Brown Ischia, Osborn's Prolific, Black Provence, Early

Violet, Negro Largo, Violette de Bordeaux, Black Marseilles, Roi des Noirs, Black Ischia, Castle Kennedy, and Pitaleuse. These were all unhurt by winter of 1891-'92 The following were but slightly hurt at tips same winter: Angelique, Black Bourjassotte, White Bourjassotte, Grosse Vert, Brunswick, Bourjassotte Grise, Adriatic, White Marseilles, and San Pedro. The White Genoa was badly cut down. In the winter of 1892-'3 *all* of these were cut nearly to the ground by the unusual cold.

So far as tested, the following seem to be most productive: Brown Turkey, Celestial, Early Violet, Black Provence, Osborn's Prolific, Castle Kennedy, Negro Largo, Adriatic.

In quality, so far as fruited, we rank the following in order named: San Pedro, Adriatic, Angelique, Brunswick, White Genoa, White Marseilles, Celestial. The Celestial is the smallest of all figs, but can be eaten out of hand without skinning, as the skin has none of the acidity of the larger sorts.

Though figs of all sorts usually survive our winters without trouble, we have occasional winters in which they are badly hurt, like the last one. It is always safer then to protect at least with a shelter of pine boughs or by bending the branches to the earth and covering them with soil. This is much more quickly done than might be imagined. We have treated some of our trees in this way the present winter, and will look with interest for the results.

Peaches.

A satisfactory experiment was made the past season in the use of Bordeaux mixture to prevent the rot in peaches. A portion of our orchard was carefully sprayed and on this part a fine crop was matured. On the remainder no spraying was used, and hardly a sound peach was saved.

We would recommend spraying the trees at three different times. First, before the buds swell; second, as soon as the bloom falls; third, when the peaches are stoning or half grown. The first application should be full strength, the other two half strength.

III. BULB CULTURE.

The special adaptability of the soil and climate of North Carolina for the culture of flowering bulbs, now so largely imported from Europe, has of late attracted much attention among Northern florists.

Tuberoses, Lilies, Gladioli, and Hyacinths.

In a small section in the eastern part of the State, Tuberose bulbs have been grown with great success for some time, so that now the market for these bulbs, both in this country and in Europe, is largely supplied by North Carolina growers. It has been demonstrated that our soils and climate are equally well adapted to the growth of Lilies, Gladioli, Hyacinths and Narcissus. For the purpose of introducing the culture of some of these we have planted a variety of bulbs and have been studying their development. Most of them have done remarkably well. Lilium Candidum bulbs attained an enormous size, and Roman Hyacinths made bulbs of such quality, that one New York firm wrote for price for growing a trial order of such quality of 100,000 bulbs, which of course could not be considered by the Station and stock enough is not yet in the hands of growers here. Gladioli and Roman Hyacinths can both be grown here of superior quality and at a profit. Narcissus of some varieties have done well, but the past hard winter destroyed all those of the Polyanthus class. Our warm autumns cause these to start into growth and the cold kills them. Some of them kept until last of January and then planted, did well. These will all succeed if not planted until after Christmas, so that they will remain dormant until the weather is favorable for their development. Our surplus offsets were all put in the hands of a bulb grower in Pender County for further trial, and we hope to get the industry established here.

Propagation of Hardy Roses.

The fact that in our climate cuttings of the Hybrid Perpetual class of roses root readily when put in the open ground in the fall, like grape cuttings, can be made of great importance to our people. Northern florists are obliged to propagate them at a greater expense under glass. One of the leading New York florists sent us last fall some thousands of cuttings for trial. Unfortunately, the cuttings were from imported plants grown in the moist climate of England, and the wood was not firm and ripe enough for the best results. The very severe weather coming soon after was very destructive to many of the unripe cuttings. But from those which survived we now have strong bushes from four to six feet high. At the prices which these roses command at wholesale, their propagation ought to be a very sim-

ple and profitable matter. It will be necessary, however, to have a plantation of stock plants growing here for cuttings. With home grown wood ripened in our sunny autumns, there need be hardly one per cent. of loss in rooting these roses. Experiments made two years ago with our own wood demonstrate this. We will experiment further this winter.

IV. ACKNOWLEDGMENTS.

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